

The political revolution during the Stuart age could not have happened if there had not been a revolution in thought. This influenced not only politics, but also religion and science. By 1714 people's ideas and beliefs had changed enormously. The real Protestant revolution did not, in fact, happen until the seventeenth century, when several new religious groups appeared. But there were also exciting new scientific ideas, quite separate from these new beliefs. For the first time it was reasonable to argue that everything in the universe had a natural explanation, and this led to a new self-confidence.

Another reason for this self-confidence was the change in Britain's international position during the century. In 1603, in spite of the Armada victory of 1588 and in spite of the union of England and Scotland under one sovereign, Britain was still considered less important than France, Spain and the Holy Roman Empire. But by 1714 the success of its armies against France had made Britain a leading European power. At the same time Britain had so many new colonies that it was now in competition with earlier colonial nations, Spain, Portugal and the Netherlands.

The revolution in thought

The influence of Puritanism increased greatly during the seventeenth century, particularly among the merchant class and lesser gentry. It was the Puritans who persuaded James I to permit a new official ("authorised") translation of the Bible. It was published in 1611. This beautiful translation

was a great work of English literature, and it encouraged Bible reading among all those who could read. Although the Bible was read most by merchants and lesser gentry, many literate labourers began to read it too. Some of them understood the Bible in a new and revolutionary way. As a result, by the middle years of the seventeenth century Puritanism had led to the formation of a large number of small new religious groups, or "sects", including the "Levellers".

Most of these Nonconformist sects lasted only a few years, but two are important, the Baptists and the Quakers. In spite of opposition in the seventeenth century, both sects have survived and have had an important effect on the life of the nation. The Quakers became particularly famous for their reforming social work in the eighteenth century. These sects brought hope to many of the poor and the powerless. Social reform and the later growth of trade unionism both owed much to Nonconformism. In spite of their good work, however, the Nonconformists continued to be disliked by the ruling class until the end of the nineteenth century.

The Anglican Church, unlike the Nonconformist churches, was strong politically, but it became weaker intellectually. The great religious writers of the period, John Bunyan, who wrote *The Pilgrim's Progress*, and John Milton, who wrote *Paradise Lost*, were both Puritan.

For some Nonconformists, the opposition to their beliefs was too great to bear. They left Britain to live a free life in the new found land of America. In 1620, the "Pilgrim Fathers" sailed in a ship called the *Mayflower* to Massachusetts. Catholic families settled in Maryland for the same reasons. But most of the 400,000 or so who left England were young men without families, who did so for economic and not religious reasons. They wanted the chance to start a new life. At the same time there were other people coming in from abroad to live in Britain. Cromwell allowed Jews to settle again, the first Jews since the earlier community had been expelled 350 years earlier. And after 1685 many French Protestants, known as Huguenots, escaped from Louis XIV's persecution and settled in Britain.

The revolution in religious thinking was happening at the same time as a revolution in scientific thinking. Careful study of the natural world led to important new discoveries.

It was not the first time that the people of Britain had taken a lead in scientific matters. Almost a thousand years earlier, the English monk and historian, Bede, had argued that the earth stood still, fixed in space, and was surrounded by seven

heavens. This, of course, was not correct, but no one doubted him for centuries. In the twelfth century, during the reign of Henry I, another English scientist had gained European fame. He was Adelard of Bath, and he played a large part in the revolution in scientific thinking at the time. He knew that the Church considered his ideas dangerous. "I do not want to claim," he wrote, "that God is less than all-powerful. But nature has its own patterns and order, and we should listen to those who have learnt something of it."

In the thirteenth and early fourteenth centuries English scientists, most of them at the University of Oxford, had led Europe. Friar Roger Bacon, one of the more famous of them, had experimented with light, heat and magnetism. Another, William of Ockham, had studied falling objects. Another, William Marlee, had been one of the first to keep a careful record of the weather. Chaucer himself wrote a book to teach his son how to use an astrolabe. At the same time, the practical effects of such curiosity were seen in new machinery, water mills, geared wheels and lathes.

But the seventeenth century saw the development of scientific thinking on an entirely new scale. The new mood had been established at the very beginning of the century by a remarkable man, Francis Bacon. He became James I's Lord Chancellor, but he was better known for his work on scientific method. Every scientific idea, he argued, must be tested by experiment. With idea and experiment following one after the other, eventually the whole natural world would be understood. In the rest of the century British scientists put these ideas into practice. The British have remained at the front of experiment and research ever since.

In 1628 William Harvey discovered the circulation of blood and this led to great advances in medicine and in the study of the human body. The scientists Robert Boyle and Robert Hooke used Harvey's methods when they made discoveries in the chemistry and mechanics of breathing.

These scientific studies were encouraged by the Stuarts. The Royal Society, founded by the Stuart

monarchy, became an important centre where thinkers could meet, argue, enquire and share information. Charles II, a strong supporter of its work, gave the Royal Society firm direction "to examine all systems, theories, principles . . . elements, histories and experiments of things natural, mathematical and mechanical".

In 1666 the Cambridge Professor of Mathematics, Sir Isaac Newton, began to study gravity, publishing his important discovery in 1684. In 1687 he published *Principia*, on "the mathematical principles of natural philosophy", perhaps the greatest book in the history of science. Newton's work remained the basis of physics until Einstein's discoveries in the twentieth century. Newton's importance as a "founding father" of modern science was recognised in his own time, and Alexander Pope, a leading poet of the day, summed it up neatly:

Nature, and Nature's laws lay hid in night:
God said, *Let Newton be!* and all was light.

Newton had been encouraged and financed by his friend, Edmund Halley, who is mostly remembered for tracking a comet (Halley's Comet) in 1682. There was at that time a great deal of interest in astronomy. The discovery of the geometric movement of stars and planets destroyed old beliefs in astrology and magic. Everything, it seemed, had a natural explanation.

It was no accident that the greatest British architect of the time, Christopher Wren, was also Professor of Astronomy at Oxford. In 1666, following a year of terrible plague, a fire destroyed most of the city of London. Eighty-seven churches, including the great medieval cathedral of St Paul, were destroyed. Wren was ordered to rebuild them in the modern style, which he did with skill.

As a result of the rapid spread of literacy and the improvement in printing techniques, the first newspapers appeared in the seventeenth century. They were a new way of spreading all kinds of ideas, scientific, religious and literary. Many of them included advertisements. In 1660 Charles II advertised for his lost dog.

Life and work in the Stuart age

The situation for the poor improved in the second half of the seventeenth century. Prices fell compared with wages, and fewer people asked for help from the parish. But it was the middle groups who continued to do well. Many who started life as

yeoman farmers or traders became minor gentry or merchants. Part of their success resulted from a strong interest in farming improvements, which could now be studied in the many new books on the subject.

By the middle of the century the government had already begun to control the trade in cereals to make sure that merchants did not export these while Britain still needed them. However, by 1670 Britain was able to export cereals to Europe, where living conditions, particularly for the poor, were much worse than in Britain. This was partly the result of the Thirty Years War, 1618–48, which had badly damaged European agriculture.

Trade within Britain itself changed enormously in the seventeenth century. The different regions became less economically separate from each other. No place in Britain was more than seventy-five miles from the sea, and by 1690 few places were more than twenty miles from a river or canal. These waterways became important means of transport, allowing each region to develop its own special produce. Kent, for example, grew more fruit and vegetables to export to other regions, and became known as “the garden of England”.

Improved transport resulted in a change in buying and selling. Most towns did not have shops before the seventeenth century. They had market days when farmers and manufacturers sold their produce in the town square or marketplace. By 1690, however, most towns also had proper shops. Shopkeepers travelled around the country to buy goods for their shops, which were new and exciting and drew people from the country to see them. Towns which had shops grew larger, while smaller towns without shops remained no more than villages.

London remained far larger than any other town, with more than 500,000 people by 1650. It controlled almost all the sea trade with other countries. The next largest cities, Norwich, Newcastle and Bristol, had only 25,000 each. (London’s great plague of 1665 killed 68,000 people in only six months, almost equal to the total population of these three cities.) After the fire of 1666, the richer citizens for the first time had water supplied to their houses, through specially made wooden pipes. The city streets had traffic jams just as bad as today’s, and the noise was probably far worse, with the sound of iron-tyred wheels and the hammering of craftsmen.

In London there was a new class of rich “aristocrats”, most of whom belonged to the nobility, but not all. Money could buy a high position in British society more easily than in Europe. After 1650 the rich began to meet in the new coffeehouses, which quickly became the meeting places for conversation and politics.

Some of the old nobility, however, did not accept the new rich as equals. While new Stuart yeomen wanted to be gentry, descendants of the older Tudor gentry started to call themselves "squires", the ruling class of the countryside. They did not wish to be confused with the new gentry.

The squires and JPs governed locally during Cromwell's Protectorate, and continued to do so afterwards. They had the power to tax for local purposes, to call out soldiers and to try most criminals. They had the same interests as the government, and were therefore usually willing to

pay taxes. As one gentleman said in 1625, "we must not give an example of disobedience to those beneath us".

While the rich of London visited the coffeehouses, the ordinary people went to the drinking houses, called "alehouses", in town and country. These soon became the centre of popular culture, where news and ideas could be passed on. By the end of the century the government had secret informers watching the alehouses and listening for rebellious talk.

Family life

After the rapid increase in population in the Tudor century, the number of births began to fall in the Stuart age. In 1600 Britain and Ireland had a total population of 6 million. Although it increased to 7.7 million by 1650, the rate then started to fall. No one is quite sure why the population either rose so rapidly in the Tudor age, or steadied during the seventeenth century.

One reason for the smaller number of births was that people married later than anywhere else in Europe. Most people married in their mid twenties, and by the end of the century the average age of first marriages was even older, at twenty-seven. This, of course, meant that women had fewer babies. Some women tried to control the size of their families by breast-feeding babies for as long as possible. It also seems that more men remained unmarried than before. But the pattern of population growth and human behaviour remains puzzling. A study of south Wales, for example, shows that one in three of all heads of gentry families remained unmarried at the end of the seventeenth century. A century earlier, hardly any heads of gentry families in the area had remained unmarried. There is uncertainty as to why this should have been.

By the end of the sixteenth century there were already signs that the authority of the husband was increasing. This resulted from the weakening of wider family ties. Furthermore, just as the power of the monarch became more absolute during the sixteenth and early seventeenth centuries, so also did that of the husband and father. But while the power of the monarchy was brought under control, the authority of the head of the family continued to grow.

This power partly resulted from the increasing authority of the Church following the Reformation. The Protestants believed that personal faith was important, and put extra responsibility on the head of the family for its spiritual welfare. The father always led daily family prayers and Bible reading. In some ways he had taken the place of the priest. As a result, his wife and children belonged to him,

mind, body and soul. Absolute obedience was expected. Disobedience was considered an act against God as well as the head of the house.

One result of this increase in the father's authority was that from the early seventeenth century children were frequently beaten to break their "sinful" will. The child who was not beaten was unusual. William Penn, the Quaker who founded the colony of Pennsylvania in north America, advised parents to "love them [their children] with wisdom, correct them with affection, never strike in passion, and suit the corrections to their ages as well as their fault." It is unlikely his advice was accepted except among the Quaker sect, which rejected all violence. Another result was the loss of legal rights by women over whatever property they had brought into a marriage.

However, the Protestant religion also gave new importance to the individual, especially in Presbyterian Scotland. Many Scottish women were not afraid to stand up to both their husbands and the government on matters of personal belief. In fact many of those who chose to die for their beliefs during Scotland's "killing times" were women. This self-confidence was almost certainly a result of greater education and religious democracy in Scotland at this time.